VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Minor, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards (WQS) of 9 VAC 25-260. The discharge results from the treatment of sewage wastewater. This permit action consists of reissuing the permit with revisions to the permit, as needed, due to changes in applicable laws, guidance, and available technical information.

1. Facility Name and Address:
   Sandy's MHC, LLC STP
   10006 Hammock Bend
   Chapel Hill, NC 27517
   Location: 2044 Fairfax Pike, White Post, VA

   SIC Code: 4952 - Sewerage Systems

2. Permit No. VA0088811

   Expiration Date: December 31, 2009

3. Owner Contact: Name: Matthew Raynor
   Title: Environmental Director
   Telephone No: (919) 960-5739

4. Application Complete Date: August 7, 2009

   Permit Drafted By: Kate B. Harrigan — Date: October 23, 2009
   Reviewed By: Jason R. Dameron — Date: October 26, 2009
   Brandon Kiracofe — Date: November 9, 2009

   Public Comment Period: November 27, 2009 to December 27, 2009

5. Annual Permit Maintenance Fee per 9 VAC 25-20-142: $1,200.00
   VPDES Municipal Minor/10,001 GPD - 100,000 GPD
   Highest Permitted Flow: 0.08 MGD TMP? No > 5 outfalls? No

6. Receiving Stream Name: Crooked Run, U.T. — River Mile: 1.38
   Basin: Potomac — Subbasin: Shenandoah
   Section: 1c — Class: IV
   Special Standards: pH
   Impaired? Yes — Tidal Waters? No
   Watershed Name: VAV-B56R Upper Crooked Run

7. Operator License Requirements per 9 VAC 25-31-200.C: IV

8. Reliability Class per 9 VAC 25-790: II (Assigned December 29, 1994)

9. Permit Characterization:

   ☑ Private ☐ Federal ☐ State ☐POTW ☐ PVOTW
   ☐ Possible Interstate Effect ☐ Interim Limits in Other Document (attach copy of CSO)

10. Description of Treatment Works Treating Domestic Sewage: **Appendix A**

    Total Number of Outfalls = 1
    Operation and Maintenance (O&M) Manual: Approved December 21, 1999 and updated September 10, 2007.

Introduction

11. Discharge Location Description and Receiving Waters Information: **Appendix B**

    Topo Map Name: Stephens City Topo Map Number: 217C

12. Antidegradation Review & Comments per 9 VAC 25-260-30: Tier: 1

    The State Water Control Board's Water Quality Standards (WQS) includes an antidegradation policy. All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

    The antidegradation review begins with a Tier determination. Crooked Run, U.T. in the immediate vicinity downstream of the discharge point is determined to be Tier 1 water because it is an intermittent stream with low flow conditions equal to 0 MGD. Antidegradation baselines are not calculated for Tier 1 waters.

13. Site Inspection: Performed by: Susan Shifflett Date: August 21, 2008

14. Effluent Screening and Effluent Limitations: **Appendix C**

15. Management of Sewage Sludge: Sludge use and disposal is covered in the Sludge Management Plan (SMP) approved on December 21, 1999 and updated September 10, 2007.

16. Permit Changes and Bases for Special Conditions: **Appendix D**

17. Material Storage per 9 VAC 25-31-280.B.2: On-site storage of material is addressed in the approved O&M Manual, maintained onsite by the permittee. These documents describe procedures and practices that provide adequate measures taken to prevent stored material from reaching state waters.

18. Antibacksliding Review per 9 VAC 25-31-220.L: This permit action complies with the antibacksliding provisions of the VPDES Permit Regulation.

19. Impaired Use Status Evaluation per 9 VAC 25-31-220.D: Crooked Run, U.T. is not listed as impaired; however, Crooked Run is listed as impaired for bacteria and aquatic life (DO). A TMDL has not been prepared or approved for Crooked Run. The permit contains a re-opener condition that may allow the permit limits to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved.

20. Regulation of Users per 9 VAC 25-31-280.B.9: N/A – There are no industrial users contributing to the treatment works.

21. Storm Water Management per 9 VAC 25-31-120: Application Required? ☐ Yes ☑ No

    If "No," check one:
    - ☑ STPs: This facility does not have a design flow ≥ 1.0 MGD, nor is it required to have an approved POTW pretreatment program under 9 VAC 25-31-10 et seq.
    - ☐ Others: This facility's SIC Code(s) and activities do not fall within the categories for which a Storm Water Application submittal is required.

22. Compliance Schedules per 9 VAC 25-31-250: None

Introduction

23. Variances/Alternative Limits or Conditions per 9 VAC 25-31-280.B, 100.J, 100.P, and 100.L: The permittee has requested a waiver from sampling and reporting Fecal Coliform as part of the application. Justification for the waiver was adequate.

24. Financial Assurance Evaluation per 9 VAC 25-650-10: N/A – This facility discharges 40,000 gallons a day.

25. Nutrient Trading Regulation per 9 VAC 25-820:
Watershed General Permit (WGP) Required: ☑ Yes ☐ No
If Yes: Permit No.: VAN010013
Date General Permit Effective: January 1, 2007

26. Threatened and Endangered (T&E) Species Screening per 9 VAC 25-260-20 B.8: T&E screening was performed in accordance with Guidance Memo No. 07-2007. The DGIF and USFWS screening did not indicate the presence of state or federally listed threatened or endangered species or designated Threatened or Endangered Species Waters within the mixing zone or within 2 miles of the proposed discharge location and that are hydrologically connected to the receiving waters. The DCR screening indicated natural heritage resources in the project area. In a September 8, 2009 letter, DCR indicated that due to the scope of the activity and the distance to the resources, they do not anticipate that the project will adversely impact these natural resources. DCR also indicated that the current activity will not affect any documented state-listed threatened and endangered plants or insects. DCR also indicated that their files do not indicate the presence of any State Natural Area Preserves under their jurisdiction in the project vicinity.

27. Virginia Environmental Excellence Program (VEEP) Evaluation per § 10.1-1187.1-7: Is this facility considered by DEQ to be a participant in the Virginia Environmental Excellence Program in good standing at either the Exemplary Environmental Enterprise (E3) level or the Extraordinary Environmental Enterprise (E4) level? ☐ Yes ☑ No

28. Public Notice Information per 9 VAC 25-31-290: All pertinent information is on file, and may be inspected and copied by contacting Kate B. Harrigan at: DEQ-Valley Regional Office, P.O. Box 3000, Harrisonburg, Virginia 22801, Telephone No. (540) 574-7850, Kathleen.Harrigan@deq.virginia.gov.

    Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

29. Lagoon Integrity: A water balance protocol was submitted and approved at the last reissuance. It was determined that the lagoons meet the permeability requirements based on the data and associated evaluation submitted with this application.

30. Historical Record: The facility was built under a local health department certificate around 1965. VPDES Permit No. VA008811 was issued to the facility on December 29, 1994, with a design flow of 0.04 MGD.

Introduction

APPENDIX A

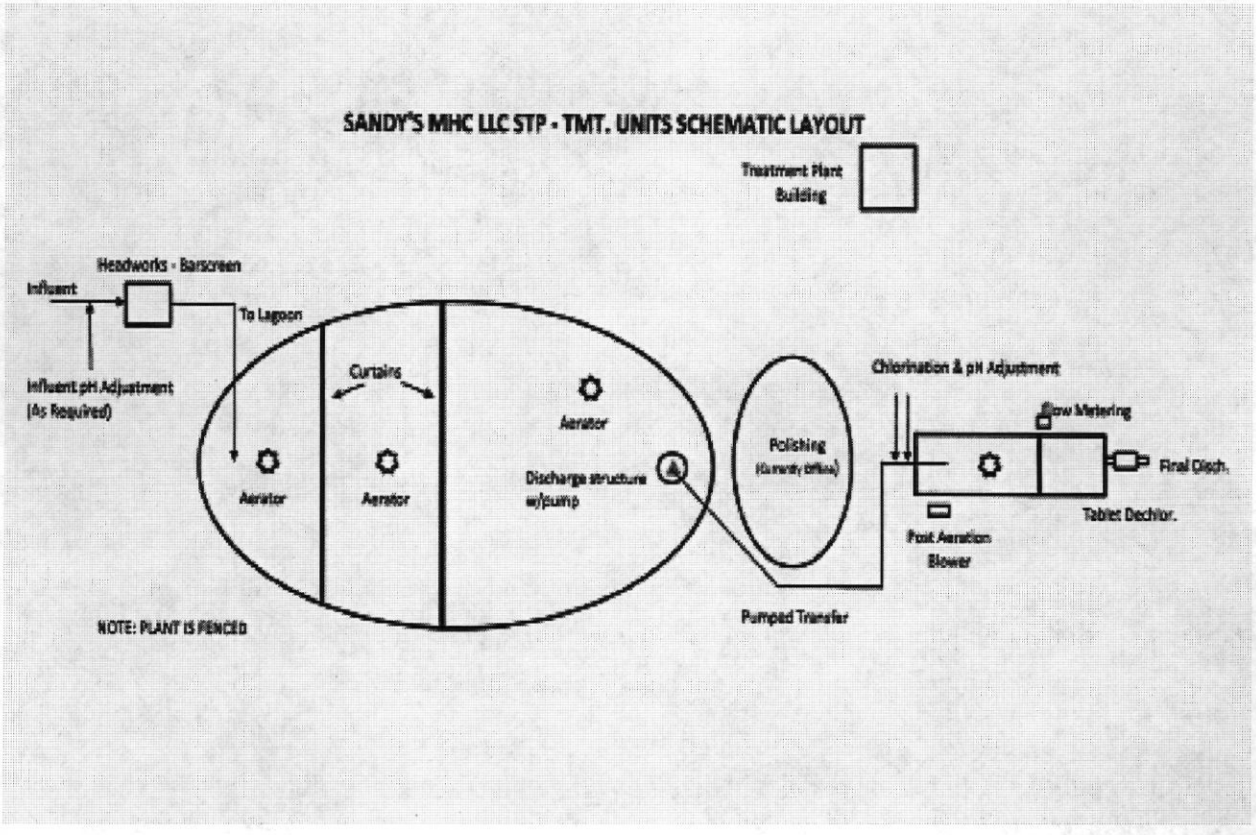
DESCRIPTION OF TREATMENT WORKS TREATING DOMESTIC SEWAGE

Operations Contributing Wastewater:

This facility serves a trailer park of approximately 115 units. Treatment facilities include two lagoons, the first aerated and having two baffles, and the second facultative, in series, followed by a chlorine contact tank, dechlorination tablet feeder, and a 90° V-notch weir box with staff gauge.

Flow:
Design Average Flow = 0.04 MGD
Monthly average flow (June 2008 – May 2009) = 0.035 MGD
The applicant is requesting additional design flow tiers for 0.06 MGD and 0.08 MGD.

Treatment Works Schematic:



APPENDIX B

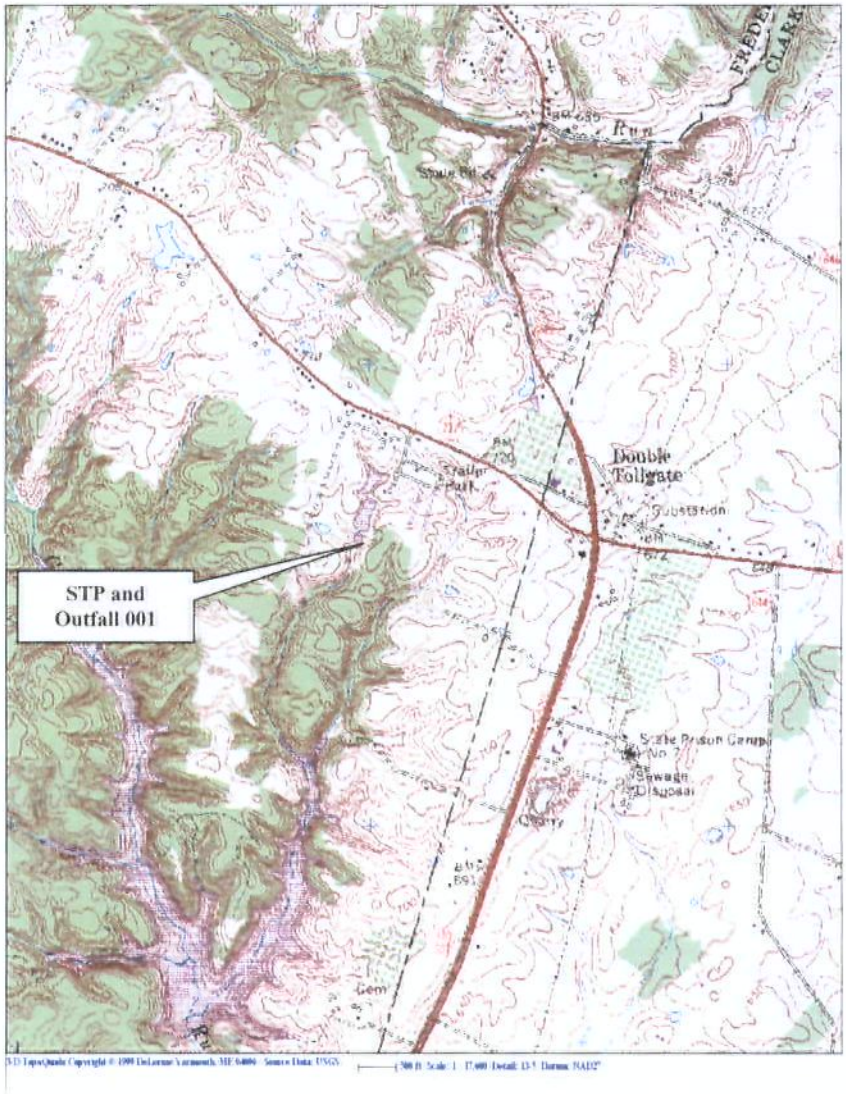
DISCHARGE LOCATION DESCRIPTION AND RECEIVING WATERS INFORMATION

This facility discharges to Crooked Run, U.T. in Frederick County. The locations of the STP and Outfall 001 are shown on the topographic map below.

Relevant points of interest within the watershed and in the vicinity of the discharge are shown on the enclosed Water Quality Assessment TMDL Review and corresponding map.

Critical flows in the receiving stream at the discharge point are described in a Flow Frequency Determination that is presented on page 4 of this appendix.

Because at critical flow conditions the stream consists solely of effluent, a mixing zone analysis was not performed.



WATER QUALITY ASSESSMENTS REVIEW
POTOMAC-SHENANDOAH RIVER BASIN
8/10/2009

IMPAIRED SEGMENTS

SEGMENT ID	STREAM	SEGMENT START	SEGMENT END	SEGMENT LENGTH	PARAMETER
B41R-02-PCB	SF Shen River/NF Shen River/Shen River	51.1	0.00	51.1	PCB in Fish Tissue
B51R-02-BAC	NF Shen River	5.29	0.00	5.29	E-coli
B55R-02-BAC	Borden Marsh Run	9.46	0.00	9.46	E-coli
B55R-03-BAC	Willow Brook	3.95	0.00	3.95	E-coli
B56R-01-BAC	Crooked Run	8.87	0.00	8.87	Fecal Coliform, E-coli
B56R-01-DO	Crooked Run	8.87	0.00	8.87	Dissolved Oxygen
B56R-02-DO	Stephens Run	.95	0.00	0.95	Dissolved Oxygen
B56R-03-DO	X-trib to Crooked Run	.09	0.00	0.09	Dissolved Oxygen

PERMITS

PERMIT	FACILITY	STREAM	RIVER MILE	LAT	LONG	WBID
VA0088811	**Sandy's Mobile Home Community**	**Crooked Run X-Trib**	**1.38**	**390335**	**780903**	**VAV-B56R**
VA0023370	White Post Correctional Unit 7	Crooked Run X Trib	3.26	390303	780820	VAV-B56R
VA0061964	Forest Lake Estates STP	Crooked Run X Trib	2.40	390331	781045	VAV-B56R
VA0067067	Christendom College	Shen River X Trib	0.16	385704	780853	VAV-B55R
VA0072044	North Fork Camp Resort STP	NF Shen River	2.47	385741	781340	VAV-B51R
VA0080080	Crooked Run STP	Crooked Run	8.96	390220	780928	VAV-B56R
VA0086100	Bierer STP	Crooked Run	3.36	385909	781103	VAV-B56R
VA0090247	Jacksons Chase WWTP	Molly Camel Run X-Trib	0.27	385504	781315	VAV-B56R

MONITORING STATIONS

STREAM	NAME	RIVER MILE	RECORD	LAT	LONG
Crooked Run	1BCRO000.43	0.43	5/9/1979	385718	781125
Shen River	1BSHN048.00	48	2/25/1968	385730	780718
Stephens Run	1BSTV004.08	4.08	7/1/1993	380319	781218
Crooked Run	1BCRO002.75	2.75	9/23/1999	385840	781116
Borden Marsh Run	1BBMR000.20	0.2	7/1/2001	385931	78517
West Run	1BWST000.20	0.2	7/1/2001	385840	781131
Stephens Run	1BSTV000.20	0.2	7/28/2003	390102	781010
Willow Brook	1BWLO000.71	0.71	8/9/2004	385846	780901
NF Shen River	1BNFS002.41	2.41	6/7/1985	385742	781349

PUBLIC WATER SUPPLY INTAKES

OWNER	STREAM	RIVER MILE

WATER QUALITY MANAGEMENT PLANNING REGULATION

Is this discharge addressed in the WQMP regulation? **No**

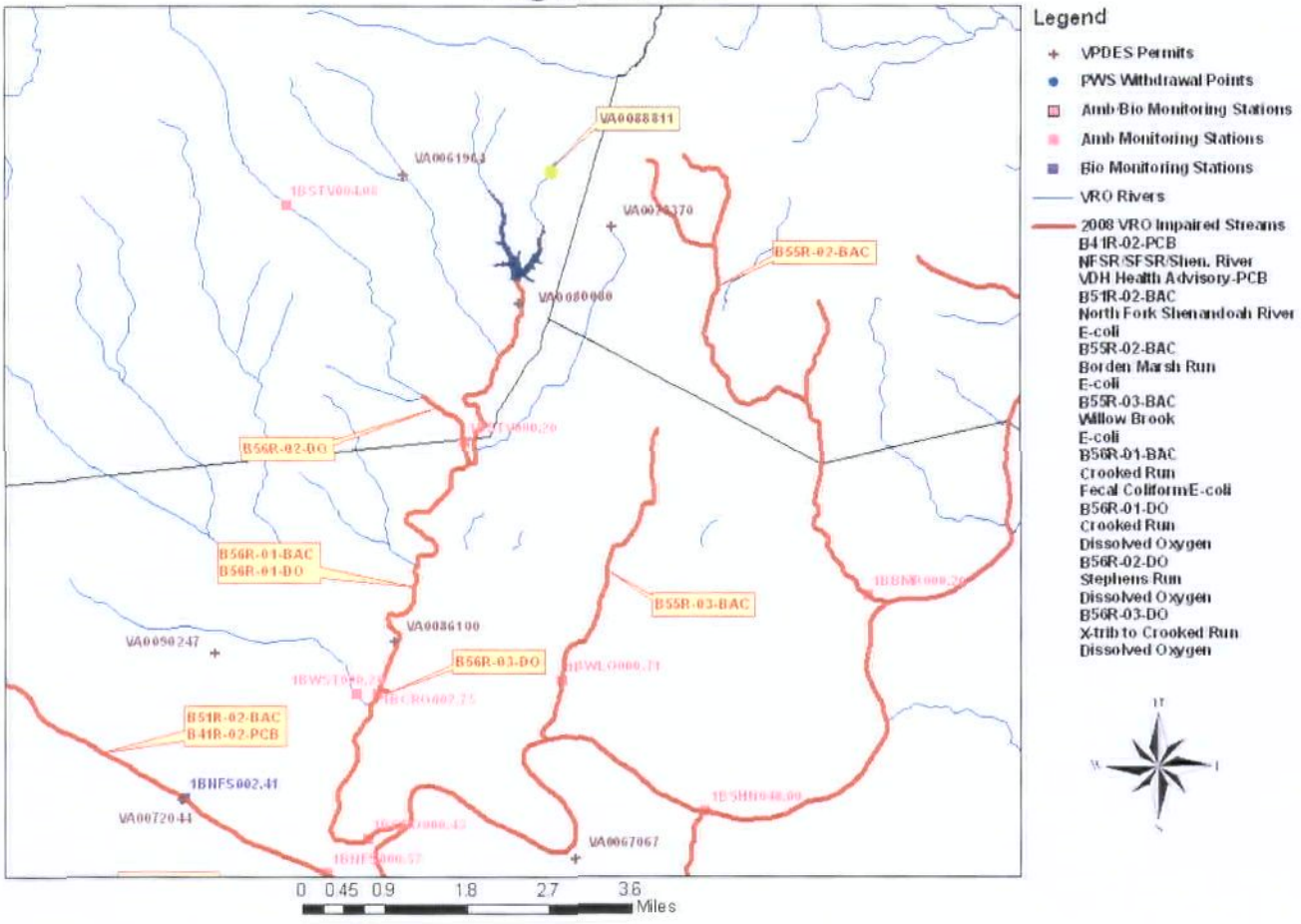
If Yes, what effluent limitations or restrictions does the WQMP regulation impose on this discharge?

PARAMETER	ALLOCATION

WATERSHED NAME

VAV-B56R Crooked Run

Sandy's MHC, LLC STP - Water Quality Assessments Review
Potomac-Shenandoah River Basin
August 10, 2009



MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
VALLEY REGIONAL OFFICE

4411 Early Road – P.O. Box 3000 **Harrisonburg, VA 22801**

SUBJECT: Flow Frequency Determination
Sandy's MHC LLC STP – VPDES Permit No. VA0088811, Frederick County

TO: Permit Processing File

FROM: Keith Showman

DATE: August 11, 2009

The USGS topographic quad map indicates that the receiving stream at the discharge point is intermittent; therefore, all the frequencies are considered to be 0.0 cfs.

APPENDIX C

EFFLUENT SCREENING AND EFFLUENT LIMITATIONS

Effluent Limitations

A comparison of technology and water quality-based limits was performed, and the most stringent limits were selected. The selected limits are summarized in the table below.

Outfall 001 **Final Limits** **Design Flow: 0.04 MGD**

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Avg.		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		1/Day	Estimate
-------	-------	Monthly Avg.		Weekly Avg.		-------	-------
$CBOD_5$	3,4,5	16 mg/L	2.4 kg/d	24 mg/L	3.6 kg/d	1/Month	Grab
TSS	2	30 mg/L	4.5 kg/d	45 mg/L	6.8 kg/d	1/Month	Grab
Ammonia-N (mg/L)	3	4.4		4.4		1/Month	Grab
Effluent Chlorine (TRC)(mg/L)*	3	0.0080		0.0098		1/Day	Grab
E. coli** (geometric mean) (N/100 mL)	3	126		NA		1/Week 10 am to 4 pm	Grab
-------	-------	Minimum		Maximum		-------	-------
pH (S.U.)	3,5	6.5		7.5		1/Day	Grab
Contact Chlorine (TRC)(mg/L)*	3,5	1.0		NA		1/Day	Grab
DO (mg/L)	3,4	5.5		NA		1/Day	Grab

NL = No Limitation, monitoring required NA = Not Applicable

* = Applicable only when chlorination is used for disinfection
** = Applicable if an alternative to chlorination is used for disinfection.

Bases for Effluent Limitations
1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. Regional Stream Model simulation (v 4.11)
5. Best Professional Judgment (BPJ)

Outfall 001 **Final Limits** **Design Flow: 0.06 MGD**

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Avg.		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		Continuous	TIRE
---	---	Monthly Avg.		Weekly Avg.		---	---
$CBOD_5$	3,5	11 mg/L	2.4 kg/d	16 mg/L	3.6 kg/d	1/Week	4 HC
TSS	2	30 mg/L	6.8 kg/d	45 mg/L	10 kg/d	1/Month	4 HC
Ammonia-N (mg/L)	3	3.0		4.4		1/Week	4 HC
Effluent Chlorine (TRC)(mg/L)*	3	0.0080		0.0098		1/Day	Grab
E. coli** (geometric mean) (N/100 mL)	3	126		NA		1/Week 10 am to 4 pm	Grab
Total Phosphorus (TP)(mg/L)	6	NL		NA		1/Month	4 HC
Total Kjeldahl Nitrogen (mg/L)	6	NL		NA		1/Month	4 HC
Nitrate-Nitrite (mg/L)	6	NL		NA		1/Month	4 HC
Total Nitrogen (TN)(mg/L)	6	NL		NA		1/Month	Calculated
---	---	Annual Average		Maximum		---	---
TP – Year to Date (mg/L)	6	NL		NA		1/Month	Calculated
TP – Calendar Year (mg/L)	5,6,7	1.0		NA		1/Year	Calculated
TN – Year to Date (mg/L)	6	NL		NA		1/Month	Calculated
TN – Calendar Year (mg/L)	5,6,7	8.0		NA		1/Year	Calculated
---	---	Minimum		Maximum		---	---
pH (S.U.)	3,5	6.5		7.5		1/Day	Grab
Dissolved Oxygen (mg/L)	3,5	5.5		NA		1/Day	Grab
Contact Chlorine (TRC)*(mg/L)	3,5	1.0		NA		1/Day	Grab

NL = No Limitation, monitoring required
TIRE = Totalizing, Indicating, and Recording equipment
NA = Not Applicable
4 HC = 4 Hour composite sample

* = Applicable only when chlorination is used for disinfection
** = Applicable if an alternative to chlorination is used for disinfection.

Bases for Effluent Limitations
1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. Regional Stream Model simulation (v 4.11)
5. Best Professional Judgment (BPJ)
6. Guidance Memo No. 07-2008, Amendment No. 2, 10/23/07, Permitting Considerations for Facilities in the Chesapeake Bay Watershed
7. Annual average concentration limits are based on the Technology Regulation, 9VAC25-40-70

Outfall 001 **Final Limits** **Design Flow: 0.08 MGD**

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Avg.		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		Continuous	TIRE
---	---	Monthly Avg.		Weekly Avg.		---	---
$CBOD_5$	3,5	8 mg/L	2.4 kg/d	12 mg/L	3.6 kg/d	1/Week	4 HC
TSS	2	30 mg/L	9.1 kg/d	45 mg/L	13 kg/d	1/Month	4 HC
Ammonia-N (mg/L)	3	3.0		4.4		1 /Week	4 HC
Effluent Chlorine (TRC)(mg/L)*	3	0.0080		0.0098		1/Day	Grab
E. coli** (geometric mean) (N/100 mL)	3	126		NA		1/Week between 10 am to 4 pm	Grab
Total Phosphorus (TP)(mg/L)	6	NL		NA		1/Month	4 HC
Total Kjeldahl Nitrogen (mg/L)	6	NL		NA		1/Month	4 HC
Nitrate-Nitrite (mg/L)	6	NL		NA		1/Month	4 HC
Total Nitrogen (TN)(mg/L)	6	NL		NA		1/Month	Calculated
---	---	Annual Average		Maximum		---	---
TP – Year to Date (mg/L)	6	NL		NA		1/Month	Calculated
TP – Calendar Year (mg/L)	5,6,7	1.0		NA		1/Year	Calculated
TN – Year to Date (mg/L)	6	NL		NA		1/Month	Calculated
TN – Calendar Year (mg/L)	5,6,7	8.0		NA		1/Year	Calculated
---	---	Minimum		Maximum		---	---
pH (S.U.)	3,5	6.5		7.5		1/Day	Grab
Dissolved Oxygen (mg/L)	3,5	5.5		NA		1/Day	Grab
Contact Chlorine (TRC)*(mg/L)	3,5	1.0		NA		1/Day	Grab

NL = No Limitation, monitoring required
TIRE = Totalizing, Indicating, and Recording equipment
NA = Not Applicable
4 HC = 4 Hour composite sample

* = Applicable only when chlorination is used for disinfection
** = Applicable if an alternative to chlorination is used for disinfection.

Bases for Effluent Limitations

1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. Regional Stream Model simulation (v 4.11)
5. Best Professional Judgment (BPJ)
6. Guidance Memo No. 07-2008, Amendment No. 2, 10/23/07, Permitting Considerations for Facilities in the Chesapeake Bay Watershed
7. Annual average concentration limits are based on the Technology Regulation, 9VAC25-40-70

Limiting Factors – Overview:

The following potential limiting factors have been considered in developing this permit and fact sheet:

Water Quality Management Plan Regulation (9 VAC 25-720-50 Potomac River Basin)	
A. TMDL limits	**None**
B. Non-TMDL WLAs	**None**
C. CBP (TN & TP) WLAs	**TN & TP by coverage under VAN010136**
Federal Effluent Guidelines	**$CBOD_5$, TSS, pH**
BPJ/Agency Guidance limits	**TRC (contact), Ammonia-N, pH, $CBOD_5$, DO**
Water Quality-based Limits - numeric	**$CBOD_5$, DO, Ammonia-N, TRC (effluent), E. coli, pH**
Water Quality-based Limits - narrative	**None**
Technology-based Limits (9 VAC 25-40-70)	**TN & TP**
Toxics Management Plan (TMP)	**None**
Storm Water Limits	**Not applicable**

EVALUATION OF THE EFFLUENT – CONVENTIONAL POLLUTANTS

The Regional Stream Model for the 0.04 MGD flow tier has been carried forward from the previous permit. That model demonstrated that the following limits are protective of WQS in Crooked Run, UT.

$CBOD_5$	=	16 mg/L
TKN	=	5.2 mg/L
DO	=	5.5 mg/L

The model did not reach background concentrations prior to entering Lake Frederick; however, based on both DGIF and DEQ monitoring data for Lake Frederick and the fact that there is no evidence of impacts to the lake because of the discharge, the previous limits are determined to be still be protective and have been carried forward from the previous permit for the 0.04 MGD flow tier.

Because the modeled effluent TKN value was more than two times the Ammonia-N WLA, it was determined that no TKN limits were needed for the 0.04 MGD flow tier because the Ammonia-N limits imposed in this permit will control TKN.

In order to maintain the currently permitted in-stream concentration of $CBOD_5$ in Crooked Run, UT and in Lake Frederick, the $CBOD_5$ loading limits for the 0.04 MGD flow tier have been imposed as the loading limits for the 0.06 MGD and 0.08 MGD flow tiers. The concentration limits for the expansion flow tiers have been adjusted accordingly to maintain the loading limits.

The permit includes annual average TN concentration limits for the 0.06 MGD and 0.08 MGD flow tiers. The permit also requires TKN monitoring in order to demonstrate compliance with the TN concentration limits. The TKN monitoring data will be used to confirm that the TKN load modeled at the 0.04 MGD flow tier is being maintained at the expansion flow tiers.

A minimum DO limit of 5.5 mg/L has been included for the 0.06 MGD and 0.08 MGD flow tiers.

The TSS limits are consistent with the Secondary Treatment Regulation and have been carried forward from the previous permit.

The minimum pH limit reflects the current WQS for pH in the receiving stream and has been carried forward from the previous permit. The facility includes an integrated pH control system that is utilized to lower the pH of the effluent. The Ammonia-N limits imposed in the permit are based on a 90th percentile pH of 7.5 SU. Because of this, the maximum pH limit has been changed from 8.0 SU to 7.5 SU at this reissuance.

EVALUATION OF THE EFFLUENT – DISINFECTION

Chlorine has been demonstrated to be effective for E. coli disinfection resulting in concentrations less than 126 cfu/100 mL; therefore, E. coli limits are specified in the permit only if the facility utilizes an alternative to chlorination for disinfection.

EVALUATION OF THE EFFLUENT – NUTRIENTS

In accordance with § 62.1-44.19:14.C.5. of the Code of Virginia, this discharger has submitted a Registration Statement and DEQ has recognized that they will be covered under the General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820-10 *et seq.*). The effective date of coverage will be January 4, 2010. Coverage under the General Permit will expire December 31, 2011.

Pursuant to section 62.1-44.19:12 - :19 of the law, Total Nitrogen (TN) and Total Phosphorus (TP) baselines are being established for this facility to represent nutrient discharge allowances as of July 1, 2005. Once established, these baselines will be used as a limiting factor should the facility ever expand or have a significant increase in effluent TN or TP concentrations. For municipal facilities, the baselines are based on the permitted design capacity of the facility. The permitted design capacity is defined as

Total N or P (lb/yr) = concentration (mg/L) x design flow (mgd) x 8.3438 x 365 (days/yr)

where

Design flow – as of July 1, 2005, the approved flow was 0.04 MGD
Concentration – the treatment provided as of July 1, 2005 was TN = 18.7 mg/L and TP = 2.5 mg/L (assumed concentrations based on secondary treatment facility)

TN = 18.7 mg/l x 0.04 mgd x 8.3438 x 365 days/yr = 2,278 lb/yr
TP = 2.5 mg/l x 0.04 mgd x 8.3438 x 365 days/yr = 304 lb/yr

The "permitted design capacity" or "permitted capacity" in terms of annual mass load of total nitrogen or total phosphorus discharged by this non-significant discharger is assumed to be that achieved at the current design flow using the currently installed technology.

Annual average concentration limits of TN = 8.0 mg/l and TP = 1.0 mg/L have been included for the 0.06 MGD and 0.08 MGD expansion flow tiers in order to ensure that the permitted design capacities are maintained.

EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS
Input parameters for instream water quality criteria (WQC) and waste load allocations (WLAs)

Stream: Because the discharge results in the only stream flow during critical low flow periods, ambient stream data is identical to the effluent data.

Effluent: The 10th percentile pH value was obtained from effluent data submitted by the permittee with the monthly DMRs. The 90th percentile pH value was based on the maximum pH that maintained by integrated pH control system that is utilized to lower the pH of the effluent. Default temperature values were used as no effluent data were available. The hardness value was obtained from monitoring data submitted by the permittee.

Effluent Parameter	Value	Units
Mean Hardness (as $CaCO_3$) =	181	mg/L
90th Percentile Temperature (Annual) =	25	°C
90th Percentile Maximum pH =	7.5	SU
10th Percentile Maximum pH =	6.8	SU

WQC and WLAs were calculated for the WQS parameters for which data is available. Those WQSs and WLAs are presented in this appendix. Current agency guidelines recommends the evaluation of toxic pollutant limits for TRC and Ammonia-N based on default effluent concentrations of 20 mg/L and 9 mg/L, respectively. Because the critical flows of the receiving stream are 0 MGD, the evaluation for all flow tiers yields the same WLAs, therefore the WLAs shown for the 0.08 MGD flow tier apply to all flow tiers. The effluent data were analyzed per the protocol for evaluation of effluent toxic pollutants included in this appendix with the following results:

- TRC: Limits identical to those in the previous permit were determined to be necessary.
- Ammonia-N: Limits identical to those in the previous permit were determined to be necessary.
- Additional monitoring data will be needed for a number of pollutants once the CTOs have been issued for the expanded facilities. The permittee must monitor the effluent at Outfall 001 for the substances noted in Attachment A of the permit within one year of the issuance of the CTO for the expanded facilities.

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name: Sandy's MHC LLC
Receiving Stream: Crooked Run, U.T.
Permit No.: VA0088811
Date: 11/18/2009
Version: OWP Guidance Memo 00-2011 (E

Stream Information		Stream Flows		Mixing Information			Effluent Information	
Mean Hardness (as CaCO3) =	mg/L	1Q10 (Annual) =	0 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	181
90% Temperature (Annual) =	deg C	7Q10 (Annual) =	0 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	25
90% Temperature (Wet season) =	deg C	30Q10 (Annual) =	0 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	15
90% Maximum pH =	SU	1Q10 (Wet season) =	0 MGD	Wet Season	- 1Q10 Flow =	100 %	90% Maximum pH =	7.5
10% Maximum pH =	SU	30Q10 (Wet season) =	0 MGD		- 30Q10 Flow =	100 %	10% Maximum pH =	6.8
Tier Designation =	1	30Q5 =	0 MGD				Current Discharge Flow =	0.04
Public Water Supply (PWS) Y/N? =	N	Harmonic Mean =	0 MGD				Discharge Flow for Limit Analysis	0.08
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Y							

Footnotes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
2. All flow values are expressed as Million Gallons per Day (MGD)
3. Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
4. Hardness expressed as mg/l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO3
5. "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
6. Carcinogen "Y" indicates carcinogenic parameter.
7. Ammonia WQSs selected from separate tables, based on pH and temperature
8. Metals measured as Dissolved unless specified otherwise.
9. WLA = Waste Load Allocation (based on standards).
10. WLA = Waste Load Allocaton (based on standards).
11. WLAs are based on mass balances (less background, if data exist).
12. Acute - 1 hour avg. concentration not to be exceeded more than 1/3 years.
13. Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
14. Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-ca and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be
15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technic

Facility Name:	Permit No.:	POST - EXPANSION WATER QUALITY CRITERIA				NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS		
Sandy's MHC LLC	VA0088811	0.080 MGD Discharge Flow - Mix per "Mixer"				0.080 MGD Discharge - Mix per "Mixer"		
Receiving Stream:	Date:			Human Health				
Crooked Run, U.T.	11/18/2009	Aquatic Protection		Public Water	Other Surface	Aquatic Protection		Human
Toxic Parameter and Form	Carcinogen?	Acute	Chronic	Supplies	Waters	Acute	Chronic	Health
Ammonia-N (Annual)	N	2.0E+01 mg/L	2.2E+00 mg/L	None	None	2.0E+01 mg/L	2.2E+00 mg/L	N/A
Chlorine, Total Residual	N	1.9E-02 mg/L	1.1E-02 mg/L	None	None	1.9E-02 mg/L	1.1E-02 mg/L	N/A

PROTOCOL FOR THE EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Toxic pollutants were evaluated in accordance with OWP Guidance Memo No. 00-2011 (8/24/00). Acute and Chronic Waste Load Allocations (WLA_a and WLA_c) were analyzed according to the protocol below using a statistical approach (STAT.exe) to determine the necessity and magnitude of limits. Human Health Waste Load Allocations (WLA_{hh}) were analyzed according to the same protocol through a simple comparison with the effluent data. If the WLA_{hh} exceeded the effluent datum or data mean, no limits were required. If the effluent datum or data mean exceeded the WLA_{hh}, the WLA_{hh} was imposed as the limit.

Since the discharge is to an intermittent stream, all upstream (background) pollutant concentrations are assumed to be "0".

The steps used in evaluating the effluent data are as follows:

A. If all data are reported as "below detection" or < the required Quantification Level (QL), and at least one detection level is ≤ the required QL, then the pollutant is considered to be not significantly present in the discharge and no further monitoring is required.

B. If all data are reported as "below detection", and all detection levels are > the required QL, then an evaluation is performed in which the pollutant is assumed present at the lowest reported detection level.

   B.1. If the evaluation indicates that no limits are needed, then the existing data set is adequate and no further monitoring is required.
   B.2. If the evaluation indicates that limits are needed, then the existing data set is inadequate to make a determination and additional monitoring is required.

C. If any data value is reported as detectable at or above the required QL, then the data are adequate to determine whether effluent limits are needed.

   C.1. If the evaluation indicates that no limits are needed, then no further monitoring is required.
   C.2. If the evaluation indicates that limits are needed, then the limits and associated requirements are specified in the draft permit.
   C.3. (Exception for Metals data only) If the evaluation indicates that limits are needed, but the data are reported as a form other than "Dissolved", then the existing data set is inadequate to make a determination and additional monitoring is required.

Parameter	CASRN	Type	QL	Data	Source of Data	Data Eval
Ammonia-N (mg/L)	766-41-7	X	0.2 mg/L	**Default = 9 mg/L**	a	C.2
TRC (mg/L)	7782-50-5	X	0.1 mg/L	**Default = 20 mg/L**	a	C.2

"Type" column indicates a category assigned to the referenced substance (see below):
X = Miscellaneous Compounds and Parameters

CASRN = Chemical Abstract Service Registry Number for each parameter is referenced in the current Water Quality Standards. A unique numeric identifier designating only one substance. The Chemical Abstract Service is a division of the American Chemical Society.

"Source of Data" codes:
a = Agency default values per GM 00-2011

"Data Evaluation" codes:
See section titled "EVALUATION OF EFFLUENT TOXIC POLLUTANTS"
(preceding the parameter table) for an explanation of the code used.

STAT.EXE Results

0.04 MGD Flow Tier

Ammonia-N
Chronic averaging period = 30
WLAa = 20
WLAc = 2.2
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.43887420551588
Average Weekly Limit = 4.43887420551589
Average Monthly Limit = 4.43887420551589

The data are: 9

0.06 MGD and 0.08 MGD Flow Tiers

Ammonia-N
Chronic averaging period = 30
WLAa = 20
WLAc = 2.2
Q.L. = 0.2
# samples/mo. = 4
# samples/wk. = 1

Summary of Statistics:
observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.43887420551588
Average Weekly Limit = 4.43887420551589
Average Monthly Limit = 3.03497247040896

The data are: 9

0.04 MGD, 0.06 MGD, and 0.08 MGD Flow Tiers

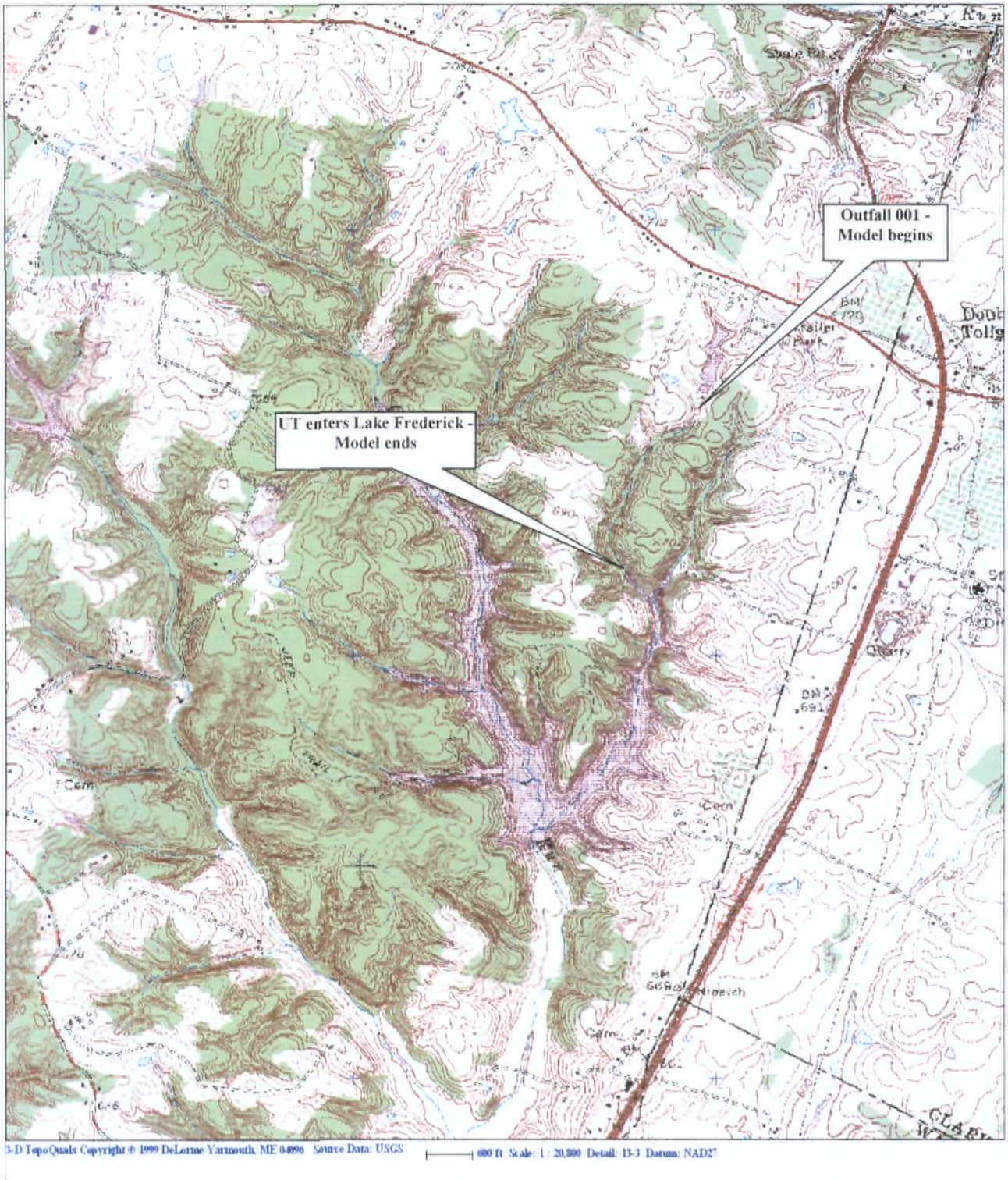
TRC
Chronic averaging period = 4
WLAa = 0.019
WLAc = 0.011
Q.L. = 0.1
# samples/mo. = 30
# samples/wk. = 7

Summary of Statistics:
observations = 1
Expected Value = 20
Variance = 144
C.V. = 0.6
97th percentile daily values = 48.6683
97th percentile 4 day average = 33.2758
97th percentile 30 day average= 24.1210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1.60883226245855E-02
Average Weekly Limit = 9.8252545713861E-03
Average Monthly Limit = 7.9737131838758E-03

The data are: 20

Map of Modeled Segment:



Model Input - 0.04 MGD:

REGIONAL MODELING SYSTEM VERSION 4.0
Model Input File for the Discharge
to CROOKED RUN, U.T..

File Information

File Name:	E:\PERMITS\VA0088811-sandys mobile court stp\2
Date Modified:	December 03, 2004

Water Quality Standards Information

Stream Name:	CROOKED RUN, U.T.
River Basin:	Potomac/Shenandoah Rivers Basin
Section:	1c
Class:	IV - Mountainous Zones Waters
Special Standards:	pH

Background Flow Information

Gauge Used:	N/A
Gauge Drainage Area:	1 Sq.Mi.
Gauge 7Q10 Flow:	0 MGD
Headwater Drainage Area:	0.08 Sq.Mi.
Headwater 7Q10 Flow:	0 MGD (Net; Includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	0 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	25 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.325755 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	670 ft above MSL
Model End Elevation:	620 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0
Model Input File for the Discharge
to CROOKED RUN, U.T..

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	SANDY'S MOBILE ESTATES STP
VPDES Permit No.:	

Discharger Flow Information

Flow:	0.04 MGD
cBOD5:	16 mg/l
TKN:	5.2 mg/l
D.O.:	5.5 mg/l
Temperature:	25 Degrees C

Geographic Information

Segment Length:	0.49 miles
Upstream Drainage Area:	0.08 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	670 Ft.
Downstream Elevation:	620 Ft.

Hydraulic Information

Segment Width:	3 Ft.
Segment Depth:	0.13 Ft.
Segment Velocity:	0.17 Ft/Sec.
Segment Flow:	0.04 MGD
Incremental Flow:	0 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Irregular
Character:	Severely Meandering
Pool and Riffle:	Yes
Percent Pools:	70
Percent Riffles:	30
Pool Depth:	0.17 Ft.
Riffle Depth:	0.04 Ft.
Bottom Type:	Gravel
Sludge:	None
Plants:	None
Algae:	Only On Edges

Model Output - 0.04 MGD:

```
Model_lake_do_v2.txt                                              12/3/04

"Model Run For E:\PERMITS\VA0088811-sandys mobile court
stp\2004\Fact_Sheet\Eff_Limits\model\Model_lake_do_v2.mod On 12/3/04 9:13:04
AM"

"Model is for CROOKED RUN, U.T.."
"Model starts at the SANDY'S MOBILE ESTATES STP discharge."

"Background Data"
"7Q10",   "cBOD5",   "TKN",     "DO",      "Temp"
"(mgd)",  "(mg/l)",  "(mg/l)",  "(mg/l)",  "deg C"
0,        2,         0,         7.326,     25

"Discharge/Tributary Input Data for Segment 1"
"Flow",   "cBOD5",   "TKN",     "DO",      "Temp"
"(mgd)",  "(mg/l)",  "(mg/l)",  "(mg/l)",  "deg C"
.04,      16,        5.5,       5.5,       25

"Hydraulic Information for Segment 1"
"Length","Width",   "Depth",   "Velocity"
"(mi)",   "(ft)",   "(ft)",    "(ft/sec)"
.49,      3,        .13,       .17

"Initial Mix Values for Segment 1"
"Flow",   "DO",      "cBOD",    "nBOD",    "DOSat",   "Temp"
"(mgd)",  "(mg/l)",  "(mg/l)",  "(mg/l)",  "(mg/l)",  "deg C"
.04,      5.5,       40,        10.825,    8.147,     25

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",   "k1@T",  "k2",    "k2@T",  "kn",    "kn@T",  "BD",    "BD@T"
1.4,    1.761,   20,      22.518,  .4,      .588,    0,       0

"Output for Segment 1"
"Segment starts at SANDY'S MOBILE ESTATES STP"
"Total",  "Segm."
"Dist.",  "Dist.",   "DO",      "cBOD",    "nBOD"
"(mi)",   "(mi)",    "(mg/l)",  "(mg/l)",  "(mg/l)"
0,        0,         5.5,       40,        10.825
.1,       .1,        5.139,     37.546,    10.599
.2,       .2,        5.084,     35.242,    10.377
.3,       .3,        5.159,     33.08,     10.16
.4,       .4,        5.286,     31.05,     9.948
.49,      .49,       5.416,     29.33,     9.761


"END OF FILE"
```

APPENDIX D

PERMIT CHANGES AND BASES FOR SPECIAL CONDITIONS

Tabulated below are the sections of the permit, with any changes and the reasons for the changes identified. Also provided is the basis for each of the permit special conditions.

Cover Page
- Content and format as prescribed by the VPDES Permit Manual.
- The city reference was removed.
- The facility location was revised to the 991-system address.

Part I.A.1. **Effluent Limitations and Monitoring Requirements – 0.04 MGD:** Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual.

Updates Part I.A.2. of the previous permit with the following:
- Slight changes were made to the format and introductory language.
- A footnote requiring at least 85% removal of TSS was added.

Part I.A.2. **Effluent Limitations and Monitoring Requirements – 0.06 MGD:** *New Requirement.* Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual.

Part I.A.3. **Effluent Limitations and Monitoring Requirements – 0.08 MGD:** *New Requirement.* Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual.

Part I.B. **TRC Effluent Limitations and Monitoring Requirements:** *Updates Part I.B of the previous permit.* Required by Sewage Collection and Treatment (SCAT) Regulations and 9 VAC 25-260-170, Bacteria; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

Part I.C. **Effluent Limitations and Monitoring Requirements – Additional Instructions:** *Updates Part I.D. of the previous permit.* Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Part I.D.1. **95% Capacity Reopener:** *Identical to Part I.F.1. of the previous permit.* Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for certain permits.

Part I.D.2. **Indirect Dischargers:** *Identical to Part I.F.2. of the previous permit.* Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for all STPs that receive waste from someone other than the owner of the treatment works.

Part I.D.3. **Materials Handling/Storage:** *Identical to Part I.F.3. of the previous permit.* 9 VAC 25-31-280.B.2. requires that the types and quantities of "wastes, fluids, or pollutants which are … treated, stored, etc." be addressed for all permitted facilities.

Part I.D.4. **O&M Manual Requirement:** *Updates Part I.F.5. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs. Added requirement to describe procedures for documenting compliance with the permit requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.

Part I.D.5. **CTC/CTO Requirement:** *Updates Part I.F.4. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs.

Part I.D.6. **SMP Requirement:** *Updates Part I.F.7. of the previous permit.* VPDES Permit Regulation 9 VAC 25-31-100 P, 220 B 2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements are derived from the Virginia Pollution Abatement Permit Regulation (9 VAC 25-32-10 *et seq.*)

Part I.D.7. **Licensed Operator Requirement:** *Identical to Part I.F.8. of the previous permit.* The VPDES Permit Regulation 9 VAC 25-31-200 C, the Code of Virginia 54.1-2300 et seq., and Rules and Regulations for Waterworks and Wastewater Works Operators 18 VAC 160-20-10 et seq., require licensure of operators. A class II license is indicated for this facility.

Part I.D.8. **Reliability Class:** *Identical to Part I.F.9. of the previous permit.* Required by SCAT Regulations 9 VAC 25-790. Class II status was assigned to this facility on December 29, 1994.

Part I.D.9. **Water Quality Criteria Monitoring:** *New Requirement.* State Water Control Law at 62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.

Part I.D.10. **Treatment Works Closure Plan:** *Updates Part I.F.10. of the previous permit.* Closure plans are required for all STPs, per the State Water Control Law at 62.1-44.18.C. and 62.1-44.15:1.1., and the SCAT Regulation at 9 VAC 25-790-450.E. and 9 VAC 25-790-120.E.3.

Part I.D.11. **Reopeners:**

New Requirement: a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

New Requirement: b. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

New Requirement: c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Updates Part I.F.6. of the previous permit: d. Required by the VPDES Permit Regulation, 9 VAC 25-31-220.C, for all permits issued to STPs.

Part I.D.12 **Suspension of concentration limits for E3/E4 facilities:** *New Requirement.* 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

Part II CONDITIONS APPLICABLE TO ALL VPDES PERMITS. VPDES Permit Regulation 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

Deletions: Part I.F.11. Instream monitoring requirement has been removed at this reissuance because past lake monitoring by DGIF and DEQ has not indicated that the discharge has caused any impacts to the lake.

DELETIONS

Tabulated below are the sections of the previous permit that were deleted and the basis for this action.

Part I.A.1. **Effluent Limitations and Monitoring Requirements – 0.04 MGD (prior to pH stabilization upgrade):** This requirement was removed at this reissuance because the pH stabilization upgrade has been completed.

Part I.F.11. **Instream Monitoring:** This requirement was removed at this reissuance because the permit limits were developed to protect WQS in Lake Frederick without the need for instream monitoring to verify that WQS are being met.